MGG15995014

| SEQUENCE NUMBER | SHIP/CRUISE + STATION NO | LATITUDE | LONGITUD | SAMPLING DEVICE | | WATER DEPTH (M | CORE LENGTH (M) | | REF NO. | RECORD NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|
| 4000007 | V22-211G | 26.700N? | 31.450W? | TRIP | CORE | 4402 | 0.33 | LDGO | A171 | 19819 |
| 4000008 | CHAL-STA7 | 23.383N | 31.517W | GRAVITY | CORE | 5033 | 0.00 | | A012 | 19820 |
| 4000009 | DOLPHIN 12 | 29.483N | 32.333W | MISC | GRAB | 4976 | 0.00 | | N020 | 19821 |
| 4000010 | VEMA 27-169 | 25.833N | 32.437W | PISTON | CORE | 4960 | 2.92 | LDGO | A124 | 19822 |
| 4000011 | V27-169G | 23.833N | 32.437W | TRIP | CORE | 4960 | 0.54 | LDGO | A171 | 19823 |
| 4000012 | VEMA 27-171 | 24.737N | 32.558W | PISTON | CORE | 4693 | 10.32 | LDGO | A124 | 19824 |
| 4000013 | CH199-2-6-7 | 29.51?N | 32.527W | PISTON | CORE | 4307 | 7.19 | | A175 | 19825 |
| 4000014 | CHAL-STA8 | 23.2??N | 32.933W | GRAVITY | CORE | 4941 | 0.00 | | A012 | 19826 |
| 4000015 | SEDUV 61-3 | 26.977N | 33.445W | GRAVITY | CORE | 5300 | 1.30 | USSR | N833 | 19827 |
| 4000016 | VE10 -10-87 | 24.9??N | 33.475W | PISTON | CORE | 5329 | 6.10 | LDGO | B622 | 19828 |
| 4000017 | CHAL-STA353 | 26.35?N | 33.617W | GRAVITY | CORE | 5426 | 0.00 | | A012 | 19829 |
| 4000018 | VEMA 27-170 | 24.43?N | 34.037W | PISTON | CORE | 6224 | 10.75 | LDGO | A124 | 19830 |
| 4000019 | V27-170G | 24.43?N | 34.037W | TRIP | CORE | 6224 | 0.61 | LDGO | A171 | 19831 |
| 4000020 | VEMA 19-306 | 28.467N | 34.117W | PISTON | CORE | 5127 | 6.13 | LDGO | N753 | 19832 |
| 4000021 | VE17 -163 | 27.967N | 34.133W | PISTON | CORE | 5132 | 13.27 | LDGO | B654 | 19833 |
| 4000022 | V17-163G | 27.967N | 34.133W | TRIP | CORE | 5132 | 0.30 | LDGO | A171 | 19834 |
| 4000023 | ZEPH-1-22G | 25.083N | 34.217W | GRAVITY | CORE | 5601 | 1.56 | SIO | A057 | 19835 |
| 4000024 | VEMA 22-212 | 23.033N | 34.483W | PISTON | CORE | 6081 | 7.61 | LDGO | A108 | 19836 |
| 4000025 | V22-212G | 23.033N | 34.483W | TRIP | CORE | 6081 | 0.39 | LDGO | A171 | 19837 |
| 4000026 | VEMA 27-259 | 26.768N | 34.887W | PISTON | CORE | 5596 | 8.60 | LDGO | A124 | 19838 |
| 4000027 | DOLPHIN 18 | 29.100N | 34.942W | MISC | GRAB | 4590 | 0.00 | | N020 | 19839 |
| 4000028 | ALICEII-2075 | 25.95?N | 35.133W | MISC | GRAB | 5580 | 0.00 | | A019 | 19840 |
| 4000029 | ALICEII-2076 | 25.95?N | 35.133W | | DREDGE | 2700 | 0.00 | | A019 | 19841 |
| 4000030 | CHAL-STA9 | 23.383N | 35.183W | GRAVITY | CORE | 5765 | 0.00 | | A012 | 19842 |
| 4000031 | ALICEII-2081 | 26.617N | 36.583W | MISC | GRAB | 5382 | 0.00 | | A019 | 19843 |
| 4000032 | CH199-2-7-5P | 29.307N | 36.612W | PISTON | CORE | 3936 | 7.32 | | A175 | 19844 |
| 4000033 | DOLPHIN 14 | 28.7??N | 36.642W | MISC | GRAB | 4707 | 0.00 | | N020 | 19845 |
| 4000034 | VEMA 27-257 | 27.768N | 36.732W | PISTON | CORE | 5136 | 6.21 | LDGO | A124 | 19846 |
| 4000035 | VE17 -164 | 29.617N | 36.917W | PISTON | CORE | 4433 | 5.14 | LDGO | B654 | 19847 |
| 4000036 | V17-164G | 29.617N | 36.917W | TRIP | CORE | 4433 | 0.23 | LDGO | A171 | 19848 |
| 4000037 | NAVADO-3 | 28.157N | 37.362W | PISTON | CORE | 4844 | 1.33 | | B761 | 19849 |
| 4000038 | V22-213G | 25.067N | 37.767W | TRIP | CORE | 4877 | 0.39 | LDGO | A171 | 19850 |
| 4000039 | VEMA 22-213 | 25.067N | 37.767W | PISTON | CORE | 4877 | 5.83 | LDGO | A100 | 19851 |
| 4000040 | VE10 -10-88 | 22.958N | 38.288W | PISTON | CORE | 4953 | 6.00 | LDGO | B622 | 19852 |
| 4000041 | CHAL-STA10 | 23.167N | 38.769W | GRAVITY | CORE | 4978 | 0.00 | | A012 | 19853 |
| 4000042 | VEMA 19-307 | 26.367N | 38.633W | PISTON | CORE | 4715 | 3.56 | LDGO | N753 | 19854 |
| 4000043 | DOLPHIN 15 | 28.2??N | 38.908W | MISC | GRAB | 4652 | 0.00 | | N020 | 19855 |
| 4000044 | SEDOV 51-4 | 25.968N | 38.953W | GRAVITY | CORE | 5200 | 0.60 | USSR | N833 | 19856 |
| 4000045 | ZEPH-1-21G | 24.267N | 39.199W | GRAVITY | CORE | 5438 | 1.28 | SIO | A057 | 19857 |
| 4000046 | NAVADO-2 | 24.852N | 39.492W | PISTON | CORE | 4449 | 2.26 | | B781 | 19858 |
| 4000047 | VEMA 22-214 | 26.008N | 39.517W | PISTON | CORE | 4147 | 7.60 | LDGO | A108 | 19859 |
| 4000048 | V20-240G | 21.867N | 39.650W | TRIP | CORE | 5446 | 0.62 | LDGO | A171 | 19860 |
| 4000049 | VEMA 20-240 | 21.467N | 39.650W | PISTON | CORE | 5446 | 11.16 | LDGO | B830 | 19861 |
| 4010001 | VEMA 26-19 | 26.275N | 40.205W | PISTON | CORE | 4548 | 5.61 | LDGO | A123 | 19862 |
| 4010002 | VEMA 26-18 | 25.616N | 40.426W | PISTON | CORE | 4433 | 3.91 | LDGO | A123 | 19863 |
| 4010003 | VEMA 26-23 | 26.61?N | 40.456W | PISTON | CORE | 4343 | 4.62 | LDGO | A123 | 19864 |
| 4010004 | VEMA 26-24 | 26.467N | 40.485W | PISTON | CORE | 4213 | 4.10 | LDGO | A123 | 19865 |
| 4010005 | VEMA 22-215 | 26.633N | 40.550W | PISTON | CORE | 4071 | 6.21 | LDGO | A108 | 19866 |
| 4010006 | CHAL-STA11 | 22.75?N | 40.617W | GRAVITY | CORE | 4712 | 0.00 | | A012 | 19867 |
| 4010007 | VEMA 26-26 | 27.06?N | 40.643W | PISTON | CORE | 4519 | 0.34 | LDGO | A123 | 19868 |
| 4010008 | VEMA 26-21 | 27.06?N | 40.643W | PISTON | CORE | 4243 | 3.50 | LDGO | A123 | 19869 |
| 4010009 | DOLPHIN 16 | 27.667N | 40.742W | MISC | GRAB | 4194 | 0.00 | | N020 | 19870 |
| 4010010 | CH199-2-6-5 | 29.368N | 40.855W | PISTON | CORE | 3301 | 1.94 | | A175 | 19871 |
| 4010011 | VEMA 22-216 | 26.767N | 40.90?W | PISTON | CORE | 3917 | 5.60 | LDGO | A108 | 19872 |
| 4010012 | VEMA 26-22 | 29.342N | 40.923W | PISTON | CORE | 4674 | 3.01 | LDGO | A123 | 19873 |
| 4010013 | ZEPH-1-13G | 29.132N | 41.017W | GRAVITY | CORE | 4632 | 0.73 | SIO | A057 | 19874 |
| 4010014 | VEMA 19-308 | 29.017N | 41.400W | PISTON | CORE | 3197 | 3.05 | LDGO | N753 | 19875 |

* There may be transcription errors due to the very poor quality of the original.

Xerox of page from listing of Southeast Asia Sediment Descriptions File

MGG 15995014

| SED. NUMBER | INTERVAL IN CORE | LITHOLOGY | PERCNT CACO3 | CONSTITUENTS BY GRAIN SIZE | ORGANIC MATERIAL OR FOSSILS | OTHER FEATURES | MINERALS |
|---|---|---|---|---|---|---|---|
| 2740001 | 0-? | MUD | | | | | |
| 2740002 | 0-9 | SAND OR SILT | | >50% SAND FINE SHELL | MACROFAUNA SHELLS | COLOR: GRAY<br>GRAYISH BROWN<br>MOTTLING | |
| 2740002 | 9-30 | SAND OR SILT | | >50% SAND FINE | | COLOR: GRAYISH BLACK | |
| 2740002 | 30-60 | SAND OR SILT | | >50% SAND SHELL | MACROFAUNA SHELLS | COLOR: GRAY<br>GRAYISH GREEN | |
| 2740002 | 60-75 | SAND OR SILT | | >50% SAND COARSE SHELL<br>10-50% CLAY | | COLOR: GRAY | |
| 2740002 | 75-83 | MUD | | >50% CLAY | | COLOR: GRAYISH GREEN | |
| 2740002 | 83-104 | MUD | | 10-50% SAND<br>>50% CLAY | | COLOR: BLACK | |
| 2740002 | 104-112 | MUD | | 10-50% SAND<br>>50% CLAY | | COLOR: GRAY<br>GRAYISH GREEN<br>DISTURBANCE OR FLOW-IN | |
| 2740002 | 112-121 | SAND OR SILT | | >50% SAND<br>10-50% CLAY | | COLOR: GRAYISH | |
| 2740002 | 121-139 | SAND OR SILT | | >50% SAND FINE<br>10-50% CLAY | | COLOR: GRAYISH GREEN<br>DISTURBANCE OR FLOW-IN | |
| 2740002 | 139-201 | MUD | | 10-50% SAND<br>>50% CLAY | | COLOR: GRAYISH GREEN<br>GRAYISH<br>TEXTURE: STIFF<br>MOTTLING<br>DISTURBANCE OR FLOW-IN | |
| 2740002 | 201-225 | SAND OR SILT | | >50% SAND SHELL<br>10-50% CLAY | MACROFAUNA SHELLS | COLOR: GRAYISH BLACK<br>GRAYISH GREEN | |
| 2740002 | 225-236 | SAND OR SILT | | >50% SAND FINE<br>10-50% CLAY | | COLOR: GREENISH GRAY | |
| 2740002 | 236-242 | MUD | | 10-50% SAND FINE<br>>50% CLAY | | COLOR: GRAYISH BLACK<br>GRAYISH GREEN | |
| 2740002 | 242-301 | MUD | | 10-50% SAND<br>>50% CLAY | | COLOR: GRAYISH GREEN<br>GRAY<br>BEDDED. MOTTLING | |
| 2740002 | 301-323 | MUD | | 10-50% SAND<br>>50% CLAY | | COLOR: GRAYISH GREEN<br>LT GRAYISH GREEN | |
| 2740002 | 323-421 | MUD | | 10-50% SAND<br>>50% CLAY | | COLOR: GRAYISH GREEN<br>LT GRAYISH GREEN<br>BEDDED. MOTTLING | |

Xerox of page from Complete listing of Bibliography file

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| B509 | LAMONT GEOLOGICAL OBSERVATORY, PRELIMINARY MEGASCOPIC DESCRIPTION CORES TAKEN ON VEMA, CRUISE 14, NOV 1957-AUG 1958. PREPARED BY GEOLOGY DEPT. UNPUBLISHED. SEE ALSO A068. (ALSO N741). | 000000657???? 000000667???? 000000677???? |
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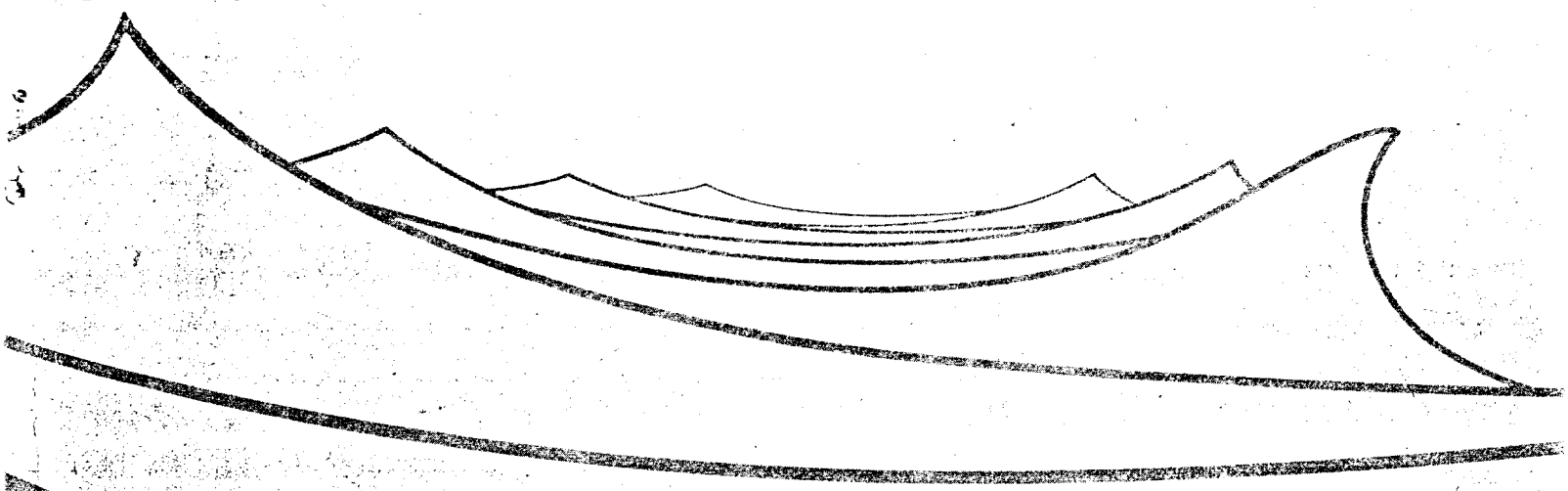
This document provides a guide to field contents.

The format in which data appear on your tape is entirely different.



# SIO REFERENCE SERIES

## SEDIMENT DATA BANK CODING INSTRUCTIONS


**J.Z. Frazer**

**N.A. Freelander**

**D.L. Hawkins**



University of California — Scripps Institution of Oceanography

17 April 1978 — Reference Number 78-9

# SEDIMENT DATA BANK CODING INSTRUCTIONS

by

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17 April 1978

SIO Reference No. 78-9

# PREFACE

This report explains how to code information for input to the SIO Sediment Data Bank. The Sediment Data Bank Users' Handbook, SIO Reference 78-10, describes the data bank and available types of output and includes instructions for data retrieval.

TABLE OF CONTENTS

## A. STATION RECORDS

One Station Record is to be coded for each core, dredge or other sample. If seafloor photographs were taken in conjunction with other sampling, they are not coded as separate stations but information from the photographs is entered in Columns 52-53. If seafloor photographs were taken where no other sampling occurred, they are coded as separate stations.

Station Records are identified by the numeral "0" in the first column. The information is coded as follows:

| Columns | Item | Explanation |
|---|---|---|
| 1 | 0 | Card number; identifies Stations record |
| 2-8 | | Leave blank |
| 9-14<br>15-21 | Latitude<br>Longitude | Latitude and longitude are expressed as degrees, minutes and tenths of minutes, right justified with decimal point omitted, followed by N, S, E or W. |
| 22-23 | Sampler Type | Coded as in Table 1. Omit if unknown. |
| 24-28 | Bathymetry | Water depth in meters, as reported in the data source (may be corrected or uncorrected). Enter as a right-justified integer. |
| 29 | Institution | Data collected from one of the institutions listed below is coded as indicated. For other institutions leave column blank.<br><br>F = Florida State University<br>H = Hawaii Institute of Geophysics<br>L = Lamont-Doherty Geological Observatory<br>O = Oregon State University<br>R = Akademiia Nauk, USSR<br>S = Scripps Institution of Oceanography<br>W = Woods Hole Oceanographic Institution |
| 30-41 | Station Name and Number | Identifies the station. Enter the cruise or ship name or an appropriate abbreviation and the station number or sample number, starting in Col. 30. May be up to 12 alphanumeric characters. |
| 42-45 | Reference | A letter followed by three digits to indicate the source of the information which is being coded. Each reference number is keyed to an item for which an entry has been made in the Bibliography File. |

TABLE 1: SAMPLER TYPES

| Sampler (Col. 22) | Type (Col. 23) | |
|---|---|---|
| C | | Core |
| | A | Heat Probe (pre-1971) |
| | B | Box |
| | C | Camera |
| | D | Dart |
| | E | Triple (pre-1971) |
| | F | Free-fall |
| | G | Gravity |
| | H | Gravity with Heat Flow Thermistors |
| | I | 5-inch Gravity |
| | J | Multiple core, up to 5 gravity corers |
| | L | Phleger |
| | M | Miscellaneous |
| | O | Gravity Oriented |
| | P | Piston |
| | R | Piston Oriented |
| | T | Trip (with piston core) |
| | V | Von Herzen |
| | W | Biological Box |
| D | | Dredge or Drag Haul |
| | A | Box |
| | B | Bucket |
| | C | Chainbag |
| | M | Miscellaneous |
| | P | Pipe |
| | R | Rock |
| | T | Trawl |
| F | | Photograph (Camera Station) |
| | D | Deeptow |
| | M | Multiple (more than one frame at same spot) |
| | O | One photo |
| | S | Survey (more than one frame, different spots) |
| | T | Television |
| G | | Grab Sampler |
| | A | Sounding |
| | B | Box |
| | C | Catcher (on camera or core) |
| | F | Free-fall |
| | K | Shipek |
| | M | Miscellaneous |
| | O | Orange Peel |
| | P | Petterson |
| | S | Snapper |
| | W | Biological |
| H | | Deep Sea Drilling Project Hole |
| | D | Drill Core |
| | S | Side Wall Core |

| | | |
|---|---|---|
| 46-50 | Length of Core | In meters. If decimal point is not entered, it is assumed to be at the right of Col. 50. For example, 140 m is coded as 140 or 140.; 231 cm is coded as 2.31. |
| 51 | Manganese Nodule Occurrence | Refers only to nodules collected by the sampler described in Cols. 22-23. If nodules were observed in seafloor photographs associated with the station, the information should be entered in Cols. 52-53, not here. Use the following codes:<br>0 or blank = unknown; no information<br>1 = nodules absent<br>2 = nodules present |
| 52 | Manganese Nodule Coverage | Code as follows:<br>0 or blank = no information<br>1 = no nodules<br>2 = sparse (<20% coverage)<br>3 = moderate (estimated 20-50% coverage)<br>4 = abundance (coverage estimated >50%) |
| 53 | Sampler Type From Which Coverage and/or Concentration Estimate Was Determined | Code as follows:<br>0 or blank = unknown<br>1 = box core or box grab<br>2 = photographs<br>3 = miscellaneous; other<br>4 = sonar<br>5 = television<br>6 = grab sampler<br>7 = coverage from photographs, concentration most likely from major sampler (Cols. 22-23) |
| 54-58 | Manganese Nodule Concentration | Seafloor concentration in $kg/m^2$. Enter as a real number to two decimal places; decimal point must be included. |
| 59 | Surface Nodules | Enter a "1" in this column if manganese nodules occurred within 10 cm of the sediment surface. |
| 60 | Buried Nodules | Enter a "1" in this column if manganese nodules occurred below 10 cm in the sediment. Both Cols. 59 and 60 may be filled if both buried and surface nodules were observed. |
| 61-62 | Surface Lithology | These codes are to give a general indication of the lithology of the surface sediment. They are not intended to constitute a comprehensive system of sediment classification such as described in Section C. If a sample does not fit into a category, do not code. Code as follows: |

VA = volcanic ash (includes volcanic mud, volcanic sand)
RO = rock
MP = manganese pavement
PC = pelagic clay
SC = siliceous clay
CC = calcareous clay
SO = siliceous ooze
CO = calcareous ooze
CS = calcareous-siliceous ooze
TM = terrigenous material (sand, silt, mud, gravel)
CT = calcareous terrigenous material
ST = siliceous mud

See Section C-1 for definitions of these terms.

63-80

These columns are not read by the update program; leave blank or use for notes.

## B. MANGANESE NODULE ANALYSES RECORDS

Manganese nodule records are identified by the digit "3" in column 1. Depending on the number of elements analyzed, there may be 3 or 4 cards for a single sample. Each subsequent card will be identified by the digits "4" and "5". Card number 5 may be used repeatedly as many times as necessary.

Card 3 is coded as follows:

| Columns | Item | Explanation |
|---|---|---|
| 1 | 3 | Card number |
| 2-4<br>5-8 | Square number<br>Sequence number | Square and sequence numbers are the same as on the Station Record which corresponds to the station from which the manganese sample was taken. Columns 2-3 should be completely filled; use leading zeroes. |
| 9-10 | Analysis number | Number analysis from 0-99 sequentially using a new number for each analysis. |
| 11-12 | Sample type | Enter the sample type according to the following code:<br>0 = unknown<br>1 = Mn nodule or nodules<br>2 = Mn nodule in sediment<br>3 = micronodules<br>4 = micronodules in sediment<br>5 = nodules and micronodules<br>6 = Mn-encrusted sediment<br>7 = Mn-coated rock<br>8 = crust, pavement<br>9 = Mn-coated organic material<br>10 = several crusts |
| 13-27 | Sample dimensions | Enter dimensions in millimeters (1 cm = 10 mm, 0.1 cm = 1 mm) as follows:<br>13-17 largest dimension or diameter<br>18-22 next largest dimension<br>23-27 smallest dimension<br>You must right justify the number or include a decimal point in the dimension. If a range is given, enter the largest dimension in columns 13-17 and the smallest dimension in columns 23-27. If dimensions are in microns, you enter a minus sign (-) before the number in cols. 13-17. |

28-29 Section analyzed

Enter the description of the section analyzed according to the following code:

0 = unknown
1 = whole
2 = half
3 = quarter
4 = fragments or pieces
5 = core or nucleus
6 = without core
7 = cross-section
8 = layer adjacent to core
9 = middle layer
10 = outer layer or outer crust
11 = inner part, without outer layer
12 = topside
13 = underside
14 = bulk composition (representative of total material on seafloor at the location)
15 = average analysis of a number of nodules
16 = composite 2-5 nodules or micronodules analyzed together
17 = composite 6-12 nodules or micronodules analyzed together
18 = composite more than 12 nodules or micronodules analyzed together

30-31 Analytical method

Enter the method according to the following code:

0 = unknown
1 = wet chemical (colorimetry, volumetry, gravimetry)
2 = x-ray fluorescence spectrometry
3 = x-ray energy spectrometry
4 = electron microprobe
5 = atomic absorption
6 = neutron activation
7 = emission spectrometry
8 = other - see reference (use for combination of methods)

If a single method was used for a majority of the elements analyzed including Mn, Fe, Co, Ni, Cu, then code that method; if not, code as "8".

32-33 Nucleus

If given, enter the description of the nucleus according to the following code:

1 = present but not described or undetermined
2 = none apparent
3 = tooth

4 = carbone
5 = pumice
6 = chert
7 = palagonite
8 = clay
9 = altered basalt
10 = volcanic
11 = nodule fragment
12 = metallic object
13 = sediment, unspecified
14 = rock, unspecified

34-37 Reference — A letter followed by three digits to indicate the source of the information being coded. Each reference number is keyed to an item for which an entry has been made in the Bibliography File.

38-72 Element concentrations (weight %) — Enter the concentrations for the following elements in the columns indicated:

| | |
|---|---|
| 38-42 | Manganese (Mn) |
| 43-47 | Iron (Fe) |
| 48-52 | Cobalt (Co) |
| 53-57 | Nickel (Ni) |
| 58-62 | Copper (Cu) |
| 63-67 | Zinc (Zn) |
| 68-72 | Molybdenum (Mo) |

If the concentration is more than 4 digits, there is an implied decimal point just before the left most column in the field. If you enter a number without a decimal point, it must be left justified. If you enter a number with a decimal point, it may be entered anywhere in the field.

73-80 These columns are to be left blank.

Card 4 is coded as follows:

| Column | Item | Explanation |
|---|---|---|
| 1 | 4 | Card number. This card may be omitted if none of the information given below is given in the source. |
| 2-4 | Square Number | |
| 5-8 | Sequence number | Same as on Card 3 |
| 9-10 | Analysis number | |

11-35 Element concentration (weight %)

Enter concentrations for the following elements in the columns indicated:

| | |
|---|---|
| 11-15 | Silicon (Si) |
| 16-20 | Calcium (Ca) |
| 21-25 | Titanium (Ti) |
| 26-30 | Lead (Pb) |
| 31-35 | Aluminum (Al) |

36-40 % weight lost

Weight lost indicates the amount of water lost when drying the sample at 110°C.

41-44 Morphology

Morphology is coded according to a simplified version of the Hawaii Institute of Geophysics classification system.[1] Enter the primary morphology as a number 1 through 7 right justified or in Col. 42. If a second primary morphology is described enter it in 42 and the first in Col. 41.

| 41-42 Primary Morphology | | 43-44 Surface Texture | |
|---|---|---|---|
| Code | Shape | Code | Texture |
| 1 | Spherical | 1 | Smooth |
| 2 | Ellipsoidal | 2 | Rough (granular or micro-botryoidal) |
| 3 | Discoidal | | |
| 4 | Poly (coaspheroidal) | 3 | Botryoidal |
| 5 | Biological | | |
| 6 | Tabular | | |
| 7 | Faceted | | |

For example, if you were given a discoidal nodule with a rough to smooth surface, you would enter it as 0321 in the four column field.

45-72 Additional element concentrations (weight %)

On this and the next card, additional elements must be entered in order of increasing atomic number. For each additional element there are 7 columns, enter the atomic number of the element followed by the concentration.

For example, if you were given 1.08% Na, you would enter it as 111.080 in the 7-column field.

73-80 These columns are to be left blank.

Card 5 is coded as follows:

| | | |
|---|---|---|
| 1 | 5 | Card number |
| 2-4 | Square number | |
| 5-8 | Sequence number | Same as on cards 3 and 4. |
| 9-10 | Analysis number | |
| 11-66 | Additional element concentrations (weight %) | Enter concentrations in the same way as on Card 4 under Additional element concentrations. Atomic number fields begin in Cols. 11,18,25,32,39,46,53 and 60. If you have more element concentrations than the space provided on these three forms, card 5 may be used repeatedly until all elements are recorded. |

DEPTH IN CORE. The depth below the seawater-sediment interface at which the sample analyzed was found is to be entered as a pseudo element concentration on either Card 4 or Card 5. The "atomic number" indicating depth is 93, and the depth in cm is entered as a right-justified integer under "element concentration." For a surface sample the depth is entered as zero (0).

67-80 These columns are to be left blank.

## C. SEDIMENT DESCRIPTION RECORDS

### 1. Notes on Sediment Classification Schemes

More than a century of sediment data collecting is represented in the Sediment Data Bank DESCRIPTIONS File. Schemes of sediment classification have evolved from the first systematic scheme which was proposed by Murray and Renard in 1884. The most recent system in wide use today was proposed in 1973 by an ad hoc group of the JOIDES Advisory Panel on Sedimentary Petrology and Physical Properties.

These changes have presented some difficulties to data bank coders. The Murray and Renard system was "primarily from a geographical point of view although subdivisions were made according to grain size, the preponderance of different groups of organisms and different kinds of inorganic materials, and color and calcium carbonate content."[2] For JOIDES, "Sediment names are. . . based solely upon parameters determined in smear slides aided by compositional and textural properties apparent to the naked eye or under the hand lens."[3]

The various schemes all use the same terms to specify major lithological divisions, although the definitions of these terms sometimes differ. Some schemes subdivide the categories, using different terms to describe somewhat different sediments that would be included in a single category by other schemes.

In order to encompass sediment descriptions prepared by all observers, the data bank has adopted a very general lithological classification system. It is based on the JOIDES system, but we have had to combine some JOIDES categories. Our system divides sediments into ten major lithological categories as listed in the Table, below.

TABLE 2: SEDIMENT DATA BANK LITHOLOGIES

| Lithology | | Definition |
|---|---|---|
| 0 | Undetermined | |
| 1 | Rock or Gravel | All indurated sediments as well as sediments with grain size > 2 mm. Includes shells, coral, or pumice if they are the major constituent, and DSDP's "indurated chalk." |
| 2 | Manganese nodules | Manganese nodules, crusts or pavement. |
| 3 | Sand or silt | Terrigenous sediment of which at least 90% of the clasts have grain size of 39 - 2000 μm. |
| 4 | Mud | Terrigenous sediments of mixed grain size. See Fig. 1, page 22. |

| | | |
|---|---|---|
| 5 | Calcareous ooze | $CaCO_3$ > 30%, < 25% siliceous remains. Calcareous material is biogenous debris from foraminifera, pteropods, or nannofossils. Includes: globigerina ooze, foram ooze, pteropod ooze, foram marl ooze, foram marl, foram chalk, globigerina and foram mud. |
| 6 | Siliceous ooze | Pelagic sediments containing > 30% skeletal remains of siliceous organisms (radiolaria, diatoms, silicoflagellates, sponge spicules and echinoid spines). |
| 7 | Clay | Pelagic clay, having < 30% $CaCO_3$, < 30% siliceous skeletons, $\geq$ 10% slow sedimentation indicators (zeolites, Fe and Mn micronodules, fish debris); Terrigenous clay, having < 50% volcanic particles, < 30% $CaCO_3$, $\geq$ 90% clay-sized particles, < 10% slow sedimentation indicators. |
| 8 | Volcanic ash | Grain size < 4 mm, and 50% or more of the sample is of pyroclastic origin. |
| 9 | Siliceous-calcareous ooze | Biogenous sediments in which siliceous and calcareous biogenous material are each > 25%. (Most sediments within this category contain enough $CaCO_3$ to be considered calcareous ooze, but many researchers find the indication of a large siliceous component useful). |
| 10 | Zeolitite | Sediment containing > 50% zeolites. |

Our system was designed to facilitate digital coding of sediment descriptions from a variety of sources and to serve the needs of specific research groups. It is not meant to replace schemes in current use for classifying marine sediments. In most cases data included in the DESCRIPTIONS records allow the user to reclassify the sediments according to any system using our Program SEARCH (see SIO Reference No. 78-10). Such reclassification is, of course, impossible if the original source contained only the lithological category with no additional descriptive information.

Several classification systems are summarized below along with the Sediment Data Bank lithological name which corresponds to each major category in the other systems.

The scheme devised by Murray and Renard[2] includes ten major sediment categories as follows:

| Term used by Murray & Renard | Definition | Data Bank Classification |
|---|---|---|
| Blue mud | Characteristically bluish gray; moderately coherent and granular; made up of land detritus, mainly quartz. Frequently found in deeper water surrounding continents. | Mud (may sometimes be classified as calcareous ooze if $CaCO_3$ >30%) |

| | | |
|---|---|---|
| Coral mud and Sand | Calcareous sediment found near coral reefs and islands, consisting largely of neritic and benthic organisms. Usually white. | Mud or sand (may be calcareous ooze if organisms have lost identity from wave action and/or other forces) |
| Diatom ooze | Characteristically yellowish or cream colored, found in cold waters of the Southern Ocean and along the northern border of the Pacific. Diatom frustules exceptionally abundant (>20%) and $CaCO_3$ < 30%. | Siliceous ooze |
| Globigerina ooze | Structure usually pulverulent - granular to coherent, fine-grained and homogenous; $CaCO_3$ > 30%: abundant remains of foraminifera (15 - 95%). | Calcareous ooze |
| Green mud | Resembles blue mud but contains glauconite. | Mud (may sometimes be classified as calcareous ooze if $CaCO_3$ >30%) |
| Pteropod ooze | Warm water deposits at moderate depths resembling globigerina ooze but with abundant molluscs, notably pteropods. | Calcareous ooze |
| Radiolarian ooze | Deposits found in the central Pacific and Indian Ocean which, "While resembling red clays in most respects, differ. . . in containing a much larger number of radiolarian shells, skeletons and spicules, together with sponge spicules and the frustules of diatoms"[2](more than 30% siliceous organisms). | Siliceous ooze |
| Red clay | Color brick red or chocolate brown, or may be gray. Plastic when wet, very coherent when dry; found in the deep ocean far from land; $CaCO_3$ <30%. | Clay |
| Red mud | A variety of blue mud found in the Yellow Sea and off the coast of Brazil; similar in mineral composition to other terrigenous deposits near the continents. | Mud (may be classified as calcareous ooze if $CaCO_3$ >30%) |
| Volcanic muds and sands | Muds and sands found around volcanic islands which contain large amounts of volcanic material; brownish gray or grayish brown; structure only slightly coherent; $CaCO_3$ <30%. | Volcanic ash if 50% of material is of volcanic origin; otherwise, mud or sand |

Noting several weaknesses in the above system, in 1944 Revelle[4] proposed a new system of sediment classifications as follows:

| Term used by Revelle | Definition | Data Bank Classification |
|---|---|---|
| I. Pelagic Deposits | Sediments of red, brown, yellow or white color which have below a certain amount of allogenic mineral and rock particles > 5 μm and which contain only small amounts of neritic organism remains | |
| A. Oozes | Skeletal remains of organisms >30% in amount | |
| Globigerina, Pteropod, Coccolith, Calcareous ooze | $CaCO_3$ >30%; skeletal remains of calcareous organisms >30% | Calcareous ooze |
| Siliceous Globigerina ooze | $CaCO_3$ >30%; abundant siliceous remains | Siliceous-calcareous ooze |
| Siliceous Diatom, Radiolarian ooze | $CaCO_3$ <30%; skeletal remains of siliceous organism >30% | Siliceous ooze |
| B. Red Clay | Skeletal remains of organisms <30% | Clay |
| II. Terrigenous deposits, called muds | Distinguished by a bluish, green, gray or black color, or presence of appreciable neritic organic remains or allogenic minerals | |
| A. Organic muds | Skeletal remains of organisms >30% | |
| Calcareous mud and sand | $CaCO_3$ >30%; calcareous organisms or neritic type | Calcareous ooze |
| Globigerina, pteropod mud | $CaCO_3$ >30%; calcareous organisms of pelagic type | Calcareous ooze |
| Siliceous Diatom, Radiolarian mud | $CaCO_3$ <30%; remains of siliceous organisms >30% | Siliceous ooze |

B. Inorganic muds Skeletal remains of organisms <30%.

| | | |
|---|---|---|
| Clayey muds | Median diameter <0.005 mm | Clay or mud, according to Fig. 1, page 22 |
| Silty or Sandy muds | Median diameter >0.005 mm | Silt, sand or mud according to Fig. 1, page 22 |

Olausson[5] proposed a classification system which is essentially the same as Revelle's but with the following modifications:

1) Calcareous oozes and muds are divided into two categories, marl oozes or muds which contain 30-60% $CaCO_3$, and chalk oozes or muds which contain >60% $CaCO_3$.

2) If $CaCO_3$ >30% and skeletal remains are >30%, the term foraminiferal (pteropod) marl or chalk ooze or mud is used; if $CaCO_3$ >30% but skeletal remains are <30%, the sediment is still classified as an ooze or an organic mud but the qualifier foraminiferal (pteropod) is omitted.

Until recently most authors and institutional core labs used either the Revelle or the Olausson system, or modifications of them without specifying which scheme they were using. Thus the data bank has had to adopt the most general classification scheme, omitting Olausson's distinction between marl and chalk oozes. For many samples the data bank user can separate the calcareous oozes with >60% $CaCO_3$ content. This parameter is given in percent if it was reported as such, or it is expressed as "high" ( > 60% for most sources, >50% for data from the USSR) or "moderate" (30-60% for most sources, 30-50% for USSR data). Of course, if the original author used the Revelle classification system or an unspecified system and did not measure $CaCO_3$, it is impossible for our coders to deduce such information.

The JOIDES system is the most recent attempt to construct a general classification system for marine sediments. It has been followed in the Deep Sea Drilling Project reports since 1974 and is used in computer processing of DSDP data[6]. A growing number of authors seem to be adopting the JOIDES system, although it is by no means followed universally. Some DSDP authors continue to use individual variations. This scheme is as follows:

| Term Used by DSDP | Definition | Data Bank Classification |
|---|---|---|
| Igneous or metamorphic rock | | Rock or gravel |

| | | |
|---|---|---|
| **Pelagic Sediments** | | |
| Pelagic clay | <30% $CaCO_3$, <30% siliceous skeletons; slow sedimentation indicators (zeolites, Fe and Mn micronodules, fish bones, etc.) >10%. | Clay |
| Zeolite clay | Zeolites are dominant constituent | Zeolitite |
| Siliceous ooze, Radiolarian ooze, Diatomaceous ooze | Soft; >30% siliceous skeletons <30% $CaCO_3$, <30% silt and clay | Siliceous ooze |
| Radiolarite, Diatomite, Chert, Porcelanite | Same as siliceous ooze but hard | Rock or gravel |
| Calcareous ooze | Soft; >30% $CaCO_3$, <30% silt and clay | Calcareous ooze |
| Chalk, Indurated chalk, Limestone | Same as calcareous ooze but firm or hard | Rock or gravel |
| **Transitional sediments** | | |
| Muddy diatom ooze | Soft; >50% diatoms; >30% silt and clay; <30% $CaCO_3$. | Siliceous ooze |
| Muddy diatomite | Same as above but hard | Rock and gravel |
| Diatomaceous mud, Siliceous mud | Soft; 10-50% diatoms; >30% silt and clay; <30% $CaCO_3$. | Siliceous ooze if diatoms >30%; otherwise, mud |
| Marly calcareous ooze | Soft, >30% $CaCO_3$, >30% silt and clay. | Calcareous ooze |
| Marly chalk, Marly limestone | Same as above but hard | Rock and gravel |
| **Terrigenous and volcanic detrital sediments** | | |
| Clay, Mud, Silt, Sand | Soft; <80% volcanic particles; <10% diatoms; <30% $CaCO_3$; slow sediment indicators <10%. Sediments subdivided into textural groups according to the diagram in Fig. 1, page 22. | Clay, mud or sand and silt |

| | | |
|---|---|---|
| Claystone<br>Mudstone<br>Shale<br>Siltstone<br>Sandstone | Same as above but hard | Rock or gravel |
| Volcanic Ash | Soft; >80% volcanic particles; grain size <4 mm. | Volcanic ash |
| Tuff | Same as above, but hard | Rock or gravel |

Like most other classification schemes, this one allows for the inclusion of various qualifiers to indicate secondary and minor sediment constituents. These are coded as described in Section C-1.

The core curators of the various oceanographic institutions may or may not classify their sediment samples according to one of the systems described above. Further, the system used by any institution may vary over the years, or among different core describers. Recent reports from Scripps Institution of Oceanography describing cores collected on some recent cruises use an adaptation of the JOIDES system, for example, whereas visual shipboard descriptions seem to follow the Revelle scheme.

Lamont-Doherty Geological Observatory uses a unique system in which the major division is based on the percentage of the sample contained in the coarse fraction (>62 microns). This system was described by Ansis Kaneps in an unpublished report[7] and is as follows:

| Term used by LDGO | Definition | Data Bank Classification |
|---|---|---|
| Coarse fraction <5%: | | |
| Chalk | >67% calcareous nannofossils; remainder is clay and silt | Calcareous ooze |
| Marl | 33-67% calcareous nannofossils; remainder is clay and silt | Calcareous ooze |
| Clay | <33% calcareous nannofossils; >67% clay and silt | Clay |
| Coarse fraction 5-30%: | | |
| Foraminiferal chalk | 5-30% foraminifera; remainder is chalk | Calcareous ooze |
| Foraminiferal marl | 5-30% foraminifera; remainder is marl | Calcareous ooze |
| Foraminiferal clay | 5-30% foraminifera; remainder is clay and silt | Clay |

| | | |
|---|---|---|
| Radiolarian (diatom) chalk | 5-30% siliceous microfossils; remainder is chalk | Calcareous ooze or siliceous-calcareous ooze depending on detailed description |
| Radiolarian (diatom) marl | 5-30% siliceous microfossils, remainder is clay and silt | Clay |
| Coarse fraction 30-80%: | | |
| Foraminiferal (pteropod) chalk ooze | 30-80% coarse calcareous microfossils; remainder is chalk | Calcareous ooze |
| Foraminiferal (pteropod) marl ooze | 30-80% coarse calcareous microfossils; remainder is marl | Calcareous ooze |
| Foraminiferal (pteropod) clay ooze | 30-80% calcareous microfossils; remainder is clay and silt | Calcareous ooze |
| Radiolarian (diatom) chalk ooze | 30-80% coarse siliceous microfossils; remainder is chalk | Siliceous or siliceous-calcareous ooze depending on detailed description |
| Radiolarian (diatom) marl ooze | 30-80% coarse siliceous microfossils; remainder is marl | Siliceous or siliceous-calcareous ooze |
| Radiolarian (diatom) clay ooze | 30-80% coarse siliceous microfossils; remainder is clay and silt | Siliceous ooze |
| Coarse fraction >80%: | | |
| Foraminiferal (pteropod) ooze | >80% coarse microfossils, predominantly foraminifera or pteropods | Calcareous ooze |
| Radiolarian (diatom) ooze | >80% coarse microfossils, predominantly radiolaria or diatoms | Siliceous ooze |

The Kaneps report does not mention the classification of terrigenous sediments, but Lamont-Doherty uses the usual terms sand, silt and mud; we presume they have the same meaning here as in other systems.

## 2. Coding Instructions

A description record is coded for each grab or dredge sample or for each layer of a core. As many layers may be described as are in the core. Since most data sources do not give complete sediment descriptions, some items will be blank.

Description Records can occupy two cards (identified by the digits "1" or "2" in Column 1). Either card or both may be used to code the description, depending upon what information is available.

Card No. 1 is coded as follows:

| Columns | Item | Explanation |
|---|---|---|
| 1 | 1 | Card number |
| 2-4<br>5-8 | Square Number<br>Sequence Number | Square and sequence numbers are those which have been assigned to the Station Record which corresponds to the station at which the sediment sample was collected. |
| 9-10 | Layer Number | The topmost layer (which may include the entire sample) is Layer 00. Going downward in the core, layers are numbered successively 01, 02, etc. If more than 99 layers are coded, begin numbering again from 01 (e.g., 98, 99, 01, 02, etc.). |
| 12 | Foraminifera | Includes skeletal remains of Globigerina. |
| 13 | Pteropods | |
| 14 | Calcareous Nannofossils | Includes coccoliths, discoasters |
| 15 | Diatoms | |
| 16 | Radiolaria | |

The amounts of the above microfossils (Cols. 12-16) are specified by the code shown below. It should be noted that most analyses have been determined by smear slide observations. Data that has been produced through chemical analyses may show a lower concentration than that arrived at by a visual core description. Allowance for this distinction has been made in the coding instructions.

0 or blank = no information

1 = probably absent. This classification can imply two different situations: a) the observer recorded the microfossil as "absent" or b) the microfossil was not specified as absent, but additional information found by the coder implied that the microfossils were absent, although this was not explicitly stated.

2 = definitely present. This code is used only for incomplete descriptions in which the actual quantity of microfossils is either not supplied or cannot be understood.

3 = rare or trace amounts, probably <10%. Includes such categories as "few " (usually 5-15%) and "negligible" and DSDP categories "trace" (<2%) and "bearing" (2-10%).

4 = low, probably 10-30%. Usually the abundances of the constituents have been estimated and listed in the description. Includes samples described as "Foraminiferal" or "Radiolarian" clay.

DSDP core describers may add the prefix "rich" to the sediment name if constituents are present in amounts of 10-25%.[8] Although DSDP descriptions always list the estimated percentages or abundance, the coder may encounter descriptions from other sources where the sediment was described as, for example, a foram-rich clay, which would be included in this category. At SIO a sediment name is prefixed by the term "bearing" for a comparable range of 5-25% (personal communication, Carolyn Glockhoff).

For DSDP and SIO, major constituents present in quantities greater than 25% provide the sediment name. Constituents are listed in order of increasing abundance from left to right. The coder can use the number of sediment names to estimate abundances. For example, a sample may have the assigned lithology "Foram, clayey, nanno ooze." The first item of three is probably less abundant than 30%; thus Forams would be in the 10-30% range. The second constituent would be likely to fall in the 30-50% range, but probably toward the lower boundary of this category. The nannofossils could also be assumed to be present in the 30-50% range, though being present in the greatest abundance they could be assumed to be in the higher end of the range.

Occasionally specimen abundances are given in terms of individuals per gram of sediment. In order to determine the percentage equivalent one must have specific knowledge of both the specimens and the region. An example would be diatoms in the Bering Sea, where 100,000 to 200,000 diatoms per gram sediment would constitute between 10 and 30%, but this cannot necessarily be applied to other regions because of variance in specimen size (personal communication, Edith Vincent, SIO).

5 = moderate, probably 30-60%. This category would include those samples described as foraminiferal or pteropod marl ooze in the Olausson or Kaneps classification systems. SIO observers require that more than 50% of the sediment consist of biogenous remains before the sediment is called an "ooze" (personal communication, Carolyn Glockoff). A "biogenous ooze" may be dominated by one skeletal type, or it may be a composite. In the latter case, the abundance of any one organism is likely to be in the low or moderate range.

6 = probably >30% and possibly >60%. This category is used when the sample is classified as "ooze" according to a system where ooze is defined as a sediment containing >30% microfossils and no further information is available.

7 = dominant, >50%. Oozes modified by the name of only one microfossil type are usually assigned to this category.

Other skeletal or plant debris present is to be indicated by entering the numeral "1" in the appropriate column:

| Column | Item | Explanation |
|---|---|---|
| 17 | Sponge spicules or echinoid spines | |
| 18 | Macrofauna Shells | Includes shell fragments as well as pelecypods, gastropods, brachiopods, balanus, ostracods, scaphopods and ostrea. |
| 19 | Other Animal Debris | Fish scales or teeth, Bryozoa, tunicates, polychaetes, ophiuroidea, stylaster. |
| 20 | Plant Debris | Includes algae |
| 21-22 | $CaCO_3$ Content | Enter the percentage as an integer, or if given qualitatively use L (low), M (moderate) or H (high) in Col. 22. If $CaCO_3$ is less than 0.5%, code as 0 (zero).<br><br>$CaCO_3$ content analyzed at intervals down a core is entered as follows: If only a few analyses are available for the core and there is no indication that the analyses represent a larger interval, delimit one-cm layers where the analyses were done. If the $CaCO_3$ was measured at regular intervals, assume that the level in the core for which there is an analysis represents the midpoint of an interval; for example, if the core is sampled at 0, 10 and 20 cm, the layers encoded would be 0-5, 5-15, and 15-25 cm.<br><br>Adjacent $CaCO_3$ values which are within about 10% of each other can be averaged. If the carbonate value reported determines a layer to be in a different lithological class from the adjacent layers, then code separately.<br><br>If a sample is described as "marl" and $CaCO_3$ is not measured, enter "M" for moderate. |
| 23 | Organic Carbon | Code as follows:<br><br>0 or blank = not specified<br>1 = <0.5%<br>2 = 0.5-1.5%<br>3 = >1.5% |
| 24 | Disturbance | If the layer had a flow-in, was stretched, contaminated or disturbed in any other way, enter a "1" in this column. |

| | | |
|---|---|---|
| 25 | Consolidation | Code as follows:<br>0 or blank = soft or not specified, unconsolidated<br>1 = soupy, semi-liquid<br>2 = firm, stiff, or partially indurated<br>3 = hard, indurated |

The presence of minerals and other features in the sample is indicated by the numeral "1" and their absence by a blank or "0" in the appropriate column:

| | | |
|---|---|---|
| 26 | Turbidite | |
| 27 | Bedded | Laminated, stratified, varved, evidence of cross-bedding |
| 28 | Graded | |
| 29 | Worm Burrows | |
| 30 | Mottling | Cannot be specifically identified as burrows |
| 31 | Volcanic Ash Layer | Ash layer within the layer of core being described |
| 32 | Dispersed Volcanic Ash | Accumulations of glass shards constitute volcanic ash. |
| 33 | $H_2S$ | Hydrogen sulfide gas |
| 34 | Manganese Pavement or Crusts | |
| 35 | Manganese Nodules | Includes samples described as concretions |
| 36 | Manganese Micronodules | Generally silt or sand-sized. Do not place a "1" in this column if the description reports merely "manganese test positive." |
| 37 | Quartz | |
| 38 | Feldspar | Includes plagioclase and orthoclase |
| 39 | Pyroxene | Includes hypersthene and augite |
| 40 | Chlorite | |
| 41 | Mica | Includes muscovite and biotite. Mica is usually a terrigenous sediment component; however, muscovite can be authigenic. |
| 42 | Glass | |
| 43 | Palagonite | |
| 44 | Glauconite | A component of "green mud" or "green sand." It is an indicator of very slow sedimentation. |

| | | |
|---|---|---|
| 45 | Barite | |
| 46 | Phillipsite | When SIO visual core descriptions indicate the presence of zeolites, phillipsite is being described. |
| 47 | Other Zeolites | Includes harmotome, clinoptilolite, etc. |
| 48 | Pyrite | |
| 49 | Other Sulfides | Includes marcasite and hydrotroilite |
| 50 | Other Dark Minerals | FeMg minerals, amphiboles (hornblende), olivine |
| 51 | Transfer? | If coded from original source, leave blank; if recoded from the old system, place a "1" in this column. |
| 53-54 | Lithology | Indicate the dominant lithology of the sample according to the codes shown below. In most cases, the lithology is that specified in the original source. However, the coder should read the full description in the source and see Table 2 before assigning the lithology. |

0 = undetermined. Used for dredge samples in which no sediment was collected and for badly disturbed samples.

1 = rock or gravel

2 = manganese nodules or pavement. This is used only if the layer consists primarily of nodules or pavement.

3 = sand or silt. Must be ≥90% sand and/or silt (see Fig. 1). Samples described as "pteropod sand" or "foram silt" are coded as calcareous ooze. Card 2 of their coded descriptions should include indication of grain size and relevant adjectives.

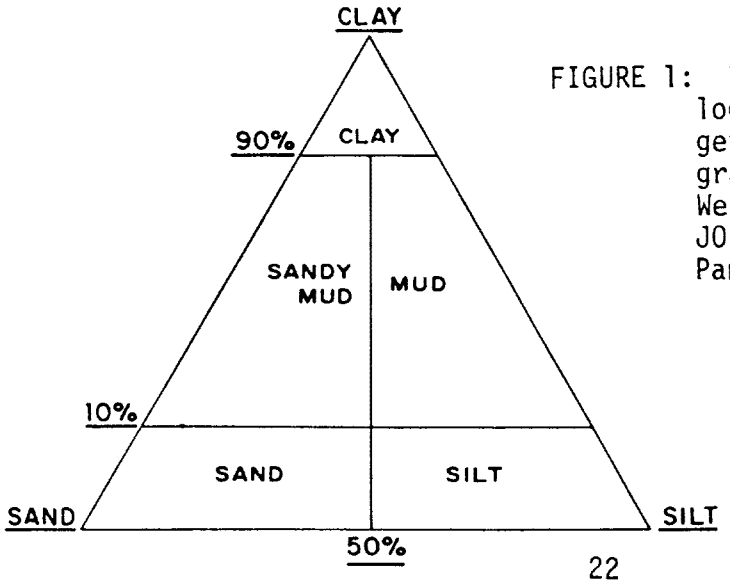


FIGURE 1: Diagram indicating lithological categories of terrigenous sediments based on grain size. Modified from Wentworth, 1922, by the JOIDES Sedimentary Petrology Panel.

4 = mud. See classification schemes in Section C-1 for various definitions of this term. It is always a terrigenous sediment, generally of mixed grain size. Data bank coders should follow DSDP definition (Fig. 1) if possible.

5 = calcareous ooze

6 = siliceous ooze

7 = clay. May be pelagic or terrigenous. Pelagic clay is fine-grained with indicators of slow sedimentation ≥10%, <20% terrigenous detrital material in the coarse fraction or <30% in the total sample, $CaCO_3$ or siliceous microfossils <30%; includes sediments described as lutite. Terrigenous clay is a terrigenous sediment with ≥90% clay-sized fraction.

8 = volcanic ash

9 = siliceous-calcareous ooze. Includes samples with >30% $CaCO_3$ and "appreciable" amounts of radiolaria or diatoms.

10 = zeolitite

Part 2 of the Description Record is identified by the numeral "2" in Column 1 and is coded as follows:

| Columns | Item | Explanation |
|---|---|---|
| 1 | 2 | Card number; identifies second part of Description Record |
| 2-10 | Square Number<br>Sequence Number<br>Layer Number | Same as for Card 1 |
| 11-16 | Top of Layer | The depth below the sediment-water interface, in centimeters, at which the layer being described begins. The top layer may or may not begin at zero. |
| 17-21 | Layer Length | The depth of the top of the layer, in centimeters, subtracted from the depth of the bottom of the layer |
| 22-24<br>25-27 | Predominant Color<br>Secondary Color | Colors are expressed by a 3-character code condensed from the Munsell system. The first character of each color code represents the <u>hue</u>:<br>R = red (R in Munsell code)<br>O = orange or yellow-red (YR 1/ to YR 5/)<br>Y = yellow (2.5Y)<br>G = green, yellow-green or olive (7.5Y, 10Y, GY, B, BG)<br>B = blue or purple (B, PB, P, RP)<br>N = neutral (black, white or gray: N)<br>T = tan or light yellow-brown (2.5Y6/ to 9/ or YR6/ to 9/) |

The second character of each color code represents the value:

W = whitish, very light, very pale (9/ or 8/ in Munsell code)
L = light (6/ or 7/)
M = moderate or unspecified (4/ or 5/)
D = dark (2/ or 3/)
B = black or very dark (1/ or 0/)

The third character indicates the saturation:

0 = little or no gray or saturation unspecified (/4 or greater in Munsell code)
1 = grayish (/2 or /3)
2 = mostly or entirely gray (/1 or N)

When the color is not given in the source according to the Munsell code, it can still be expressed by the method described above. If hue alone is given, value should be expressed as "moderate" and the saturation as zero. Various shades can be expressed as follows (where X = color):

| | |
|---|---|
| XW0 = very light X | XD0 = dark X |
| XW1 = very pale X | XD1 = dusky X |
| XW2 = X-ish white | XD2 = dark X-ish gray |
| XL0 = light X | XB0 = very dark X |
| XL1 = pale X | XB1 = very dusky X |
| XL2 = light x-ish gray | XB2 = X-ish black |

Some frequently used color names may seem difficult to translate into a code. For example, "cream colored" could be yellowish white (YW2) or very light tan (TW0), whereas beige could be light tannish gray (TL2) or pale tan (TL1). Either coding would be acceptable. Fine distinctions are unimportant, as the code is merely a scheme to accommodate general perceptions of color.

The remainder of Card 2 records information about the grain size of the layer and information about the sediment or rock types. It is coded as follows:

| Column | Item | Explanation |
|---|---|---|
| 28 | Amount of Rock | Blank = not present or not reported<br>M = present in minor or trace amounts, <10%<br>S = secondary constituent, 10-50%<br>D = dominant or only constituent, >50% |
| 29 | Amount of Gravel, Pebbles | |
| 30-32<br>33-35<br>36-38<br>39-41 | Modifiers for Rock or Pebbles | Rock and pebbles are considered together, and may have as many as four modifiers taken from Table 3. The most important modifier goes in Cols. 30-32, the next most important in Cols. 33-35, etc. |

TABLE 3: MODIFIERS FOR ROCK AND PEBBLES

| Code | Modifier |
|---|---|
| IGN | Igneous, unspecified |
| BAS | Basalt, pillow basalt, basalt glass |
| GAB | Gabbro, diabase |
| PUM | Pumice |
| BRE | Breccia, volcanic |
| VOL | Volcanic, unspecified |
| TUF | Tuff |
| AND | Andesite |
| GRA | Granite |
| PER | Periodotite |
| MET | Schist, or unspecified metamorphic |
| GRE | Greenstone |
| SER | Serpentine |
| SED | Sedimentary, unspecified |
| SAN | Sandstone, graywacke |
| MUD | Mudstone, siltstone, claystone, shale |
| CON | Conglomerate |
| LIM | Limestone |
| CHA | Chalk |
| CHE | Chert, porcelanite |
| EVA | Evaporite -- gypsum, salt |
| MNN | Mn nodules |
| MNP | Mn pavement or crust |
| MNC | Mn-coated |
| COR | Coral |
| PHO | Phosphorite nodules |
| ZEO | Zeolite nodules |
| GLA | Glacial transport material |
| SHE | Macrofauna shells |
| ALT | Altered |
| FER | Ferruginous |
| SIL | Siliceous |

| | | |
|---|---|---|
| 42-43<br>44-45 | Amount of Sand<br>Amount of Silt | These are size fractions and do not imply terrigenous origin. Code same as Amount of Rock, right justified, or express as a percentage. In general, do not code "trace," "negligible" or "<2%" amounts. |
| 46-48<br>49-51 | Modifiers for Sand and Silt | Up to two modifiers from Table 4 may be used. |

TABLE 4: MODIFIERS FOR CLAY, SAND AND SILT

| Code | Modifier |
|---|---|
| FIN | Fine |
| COA | Coarse |
| PEL | Pelagic |
| TER | Terrigenous |
| CAL | Calcareous |
| SIL | Siliceous |
| SHE | Shell |
| COR | Coral |
| VOL | Volcanic |
| FER | Ferruginous |
| ZEO | Zeolitic |

| | | |
|---|---|---|
| 52-53 | Amount of Clay | Code same as Amount of Sand or Silt |
| 54-56<br>57-59 | Modifiers for Clay | Up to two modifiers from Table 4 may be used. |
| 60-80 | | These columns are to be left blank or used for notes. |

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SCRIPPS INSTITUTION OF OCEANOGRAPHY

GEOLOGICAL RESEARCH DIVISION
LA JOLLA, CALIFORNIA 92093

January 18, 1977

Dr. J. Bruce Grant
Marine Geology and Geophysics Branch
National Geophysical and Solar-Terrestrial
Data Center
Boulder, Colorado 80302

Dear Dr. Grant:

Re: OCE 75-16025 A02
Title: "Compilation of Geochemical and Petrological Data for Seafloor Material in the Southeast Asia Area"

In accordance with the requirements as stated in "Guidelines for Submission and Dissemination of Environmental Data Collected on International Decade of Ocean Exploration Programs (revised June, 1975)", I am sending you separately by air parcel post a magnetic tape containing data compiled by us during our IDOE project.

The tape is 9-track, 800 BPI, odd-parity, unlabeled. It is blocked, units = characters, maxrecsize = 132, blocksize = 3960. There are 3 files on the tape.

File 1: Stations from the Sediment Data Bank for the SEATAR area. There are 9099 records in this file (includes lines, spaces and headings).
File 2: Sediment Descriptions for the SEATAR area stations. There are 61438 records in this file, including lines, spaces and headings.
File 3: Bibliography for the above files. There are 655 records in this file, including lines, etc.

Stations are identified in the listings by a 7-digit number starting in the first column. The first 3 digits refer to the station's 10-degree square. The last 4 digits comprise the station's sequence number in that square (assigned in order of acquisition). Sediment descriptions are matched with their stations by finding the 7-digit number common to both.

The tape I am sending you will supersede the two unblocked tapes we sent you on May 3, 1976.

Very sincerely,

Donna L. Hawkins

(Mrs.) Donna L. Hawkins
S.I.O. Sediment Data Bank